# MITIGATION
# FOR

# NAVIGATION
# DREDGING

# HERNANDO BEACH, FLORIDA

**24 May 2004**

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# 1. EXECUTIVE SUMMARY

## 1.1 Nature and Purpose of Project.

Under the Continuing Authorities Program (CAP) and, more specifically, Section 107 of the 1960 Rivers and Harbors Act, the Jacksonville District of the U.S. Army Corps of Engineers undertook a study of the feasibility of improvements to the navigation channel at Hernando Beach, Florida. The non-Federal sponsor for this study is Hernando County. The Federal interest in this project would be the benefits to commercial fishery (primarily for catch of live bait). Benefits of the project would accrue from the deepening and widening of the channel. These channel improvements would allow for reliable Gulf access, reducing transportation costs for both commercial and recreational users of the project. In summary, the project would be dredged to a depth of -8' (6' + 1' required + 1' allowable overdepth), the channel width would be 75', the project would be widened at 3 curves in the channel (5 wideners), a 175' turning basin would be constructed at the eastern terminus of the channel, and the existing non-Federal channel would be extended 4900' oceanward to reach natural deep water. See Figure 1 for location and vicinity map of project and mitigation features. See Engineering Appendix of the planning report for additional maps, drawings, and project details.

## 1.2 Project Impacts.

Approximately 60% of the channel currently contains seagrass. Most (if not all) of the seagrass would be impacted by the proposed dredging. See mitigation assessment forms at the end of this document for more detailed description of impacted and nearby resources.

## 1.3 Measures to Avoid and Minimize Impacts.

A number of channel widths, depths, and alignments were examined. In addition, various dredged material disposal options were examined. The project was designed for the least impactive alternative within the constraints of cost, project benefits, and National Economic Development (NED). The disposal option selected involves the placement of dredged rock into an off-shore area for construction of a reef. The non-rock, sandy, and silty material dredged from the channel would be placed in a nearby inland lake/borrow pit. Less costly disposal options (placement on disposal islands) would result either in greater environmental impact or less environmental benefit. Placement of dredged material into deep dredged holes in residential canals might provide some ecosystem benefit but would be substantially more costly and may not provide capacity for all the dredged material. Ocean disposal of the composite dredged material (rock, sand, and silt) would probably not provide any environmental benefit and be more costly in terms of construction cost and the testing/evaluation required. It is likely that a substantially more costly disposal option (or mitigation package) than that proposed would result in elimination of the net NED benefit and a recommendation for no Federal participation in the project.


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## 1.4 Compensatory Mitigation.

The proposed mitigation to compensate for unavoidable impacts of the project include the following features: 1) partial recovery of seagrass in the dredged channel, 2) restrictions on boat traffic in a nearby area with prop scar damage to seagrass, 3) construction of a manmade reef using rock excavated from the cannel, 4) a slow speed zone in an undeveloped tidal creek just north of the project, and 5) using other material dredged from the channel to construct a littoral and sublittoral zone in a nearby lake/borrow pit. The first two mitigation features result in restoration of seagrass areas. The manmade reef would, among other things, provide habitat for the adult stage of certain species that also utilize seagrass during their life cycle. The slow speed zone would benefit the endangered manatee which is also an important inhabitant of seagrass areas. The establishment of a freshwater littoral/sublittoral zone would be out-of-kind mitigation. For more detailed discussion see following paragraphs of this section, Section 2.0 of this document, and the mitigation assessment forms at the end of this document (Section 3.0).

### 1.4.1 Seagrass Recovery.

Seagrass is found over about 60% of the existing channel (22 acres of seagrass). It is expected that seagrass would partially recover over a period of time. The finished channel would be a little deeper and possibly with less sandy/silty bottom conducive to seagrass development. It is expected that the seagrass would recover to about 50% of the pre-dredging condition within 5 years.

### 1.4.2 Prop Scar Recovery.

About 20 acres of a 114 acre area near the channel is seagrass that is seriously impacted by prop scarring (see figures 1 and 2). With the proposed restriction on vessel traffic, this area should recover by about 50% within 5 years.

### 1.4.3 Manatee/Slow Speed Zone.

Proposed speed zone would reduce risk of injury to manatees which are known to use the area. Amount of habitat improvement would be rather small on a per acre basis. However, about 80 acres would benefit (see figures 1 and 3). This mitigation measure relates to the project impact in that manatee habitat is an important function of seagrass areas.

### 1.4.4 Artificial Reef.

About 27 acres of manmade reef would be constructed with rock dredged from the channel (see figure 4). For the purposes of “out-of-kind” mitigation, the artificial reef would compare to sea grass habitat. For calculation purposes, an acre of artificial reef is assumed to equal about 0.32 acres of sea grass with respect to ecosystem services. A number of species found on the reef utilize seagrass areas during some stage of their life (i.e., larvae and juvenile of gag grouper and gray snapper).



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1.4.5 Create Littoral/Sublittoral Zone in Lake/Borrow Pit.

Approximately 2.9 acres of littoral/sublittoral zone would be created in a nearby lake/borrow pit using the non-rock material dredged from the channel. The result would be establishment of areas that support submerged aquatic vegetation and littoral communities (emergent aquatic vegetation) would support life stages of a variety of fish and aquatic invertebrates. Expect use also by birds, reptiles, and amphibians.

## 1.5 Determination of Adequacy of Mitigation.

While there are various means of accounting for mitigation benefits, the Florida Uniform Mitigation Assessment Method (UMAM) was used to satisfy the requirements of Florida Department of Environmental Protection (DEP). Certification of water quality by DEP pursuant to Section 401 of the Clean Water Act is required for the proposed action. The required assessment forms are attached to this document. A summary of the results is given in the table below.

HERNANDO BEACH NAVIGATION CHANNEL

Impacts and Mitigation, Florida Uniform Mitigation Assessment Method

| Description | Acres | Time Delay | Time Factor | Risk Factor | Delta (Lift) | Seagrass * Conversion | Habitat Units * |
|---|---|---|---|---|---|---|---|
| Initial Project Impacts | 22 | 0 | 1 | 1 | -0.30 | 1.00 | -6.60 |
| Seagrass Recovery | 22 | 5 | 1.14 | 1 | 0.17 | 1.00 | 3.28 |
| Prop Scar Recovery | 20 | 5 | 1.14 | 2 | 0.20 | 1.00 | 1.75 |
| Artificial Reef Created | 27 | 5 | 1.14 | 1 | 0.40 | 0.32 | 2.99 |
| Lake Photic Zone | 2.9 | 5 | 1.14 | 1 | 0.57 | 0.45 | 0.65 |
| Manatee Speed Zone | 80 | 0 | 1 | 2 | 0.03 | 1.00 | 1.20 |
| | | | | | | BALANCE | 3.28 |

* All impacts and mitigation converted to equivalent seagrass habitat.

HUs=[(acres)(lift)(seagrass conversion)] ÷ [(time factor)(risk factor)]



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## 2. DESCRIPTION OF MITIGATION FEATURES

The following pages describe the measures and features identified by Mr. Frank Santo (Acting Marine Biologist and Project Coordinator, Hernando County) to mitigate the impacts of the project. Many of these items are discussed above and in the mitigation assessment forms at the end of this document. The nine recommendations by Hernando County are incorporated into the project as illustrated in the table below:

Table: Status of Environmental Recommendations

| Recommendation | Status | Mitigation Level |
|---|---|---|
| 1. Re-locate the turning basin | Incorporated into the project plans | Avoidance and Minimization of impact. |
| 2. Prop Scar Re-generation Areas | Signs to be placed by Hernando County Port Authority | Part of compensatory mitigation for project. |
| 3. Speed Zones | Signs to be placed by Hernando County Port Authority | Not counted as mitigation for the project. |
| 4. Manatee Protection Zones | For about 3,000 acre area | An 80 acre tidal creek in an undeveloped area is part of the compensatory mitigation. |
| 5. Relocate western channel end slightly north | Not incorporated into the project plans | In addition, to more dredged material and cost, calculations of seagrass impact do not show much, if any, difference in seagrass impacts. |
| 6. Mitigation and Disposal Plan | Incorporated into the project plans | Compensatory Mitigation. Dredged rock to go to artificial reef. Remaining material to go to a nearby inland lake/borrow pit to provide littoral and sublittoral habitat. |
| 7. Plant Trees on Selected Dredged Material Islands | To be accomplished by local government and volunteers | Not counted as mitigation for the project. |
| 8. Shorten the Channel | Practicability being evaluated | If accepted, Avoidance and Minimization of impact. |
| 9. Narrowing the Channel | Incorporated into the project plans | Avoidance and Minimization of impact. |



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[SEE FILE SantoLetter.pdf]

1. Letter of 25 February 2004 from Frank Santo, Acting Marine Biologist and Project Coordinator, Hernando County
2. Figure 1: Turning Basin & Channel Re-Positioning
3. Figure 2: Prop Scar Area
4. Figure 3: Prop Scar Re-Generation Areas
5. Figure 4: No Motorized Vessel Zones
6. Figure 5: No Motorized Vessel Zone
7. Figure 6: Slow Speed Zone 1
8. Figure 7: Slow Speed Zone 2
9. Figure 8: Manatee Zones November through March
10. Figure 9: Manatee Zone 1
11. Figure 10: Manatee Zone 2
12. Figure 11: Shift Channel Dig North Over Submerged Spoils
13. Figure 12: Dredge Pipeline
14. Figure 13: Planting Areas (mangrove)
15. Figure 14: [no title, no legend, no reference]



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February 25, 2004

Emilio Gonzalez
US Army Corps of Engineers
701 San Marco Boulevard
Jacksonville, FL 32207

Dear Emilio:

The various agencies of Hernando County realize that the Hernando Beach Channel Project (now requested to become a federal channel) cannot be completed without following certain federal protocols that include staying within a cost to benefit ratio calculated by the Army Corps of Engineers. We also realize this project will not move forward without providing responsible and thoughtful mitigation to offset the environmental impacts that would occur as a result of constructing and completing such a project.

Insomuch as these things are critical to achieve conclusion, it should be realized by both Hernando County and the Army Corps of Engineers that the cost of construction, mitigation and disposal of debris should all be factored into a completed and acceptable plan. The plan does not only need to pass standards acceptable to us, but must also be satisfactory to other agencies such as DEP, NOM, Florida Fish and Wildlife, EPA, and SWFWMD. These agencies and their concerns are not unknown to Army Corps and should have been considered from the onset of the project. I am pleased that per our last conversation you have found ways to reduce costs enough to allow for the all important mitigation needed to satisfy all agencies involved, and finish the Hernando Beach dredging project. In response to Army Corps position that 1999 -2001 ratios are accurate enough to use in 2004, I submit to you a copy of a recent newspaper article indicating property values rising 105% over the last 5 years in Hernando Beach -the highest in the county! Although commercial interests drive the need to make the channel wider and safer, we cannot ignore the private economic factors that are sure to have impact now and into the future. (See enclosed Hernando Times article dated February 15, 2004.)

Hernando County is committed to seeing the channel project through to completion. We have, therefore, created these final recommendations based on our local knowledge of the area, the economic impact this project will have to our commercial fishing industry, land values, recreational importance, and the overall safety a federal channel would provide for this area of Florida's west coast.

Our recommendations are based on budget, equipment, manpower, environmental impacts, and other available resources. By incorporating these proposals into our final plans for the channel, we believe further delays from the various agencies would be circumvented. As you are aware, we cannot afford more delays that would siphon additional funds from our budget.

We also believe that beyond the point of Hernando County working with Army Corps to design a final plan we can both find agreeable, it is the responsibility of the Army Corps of Engineers to communicate with, negotiate, or compromise with the various agencies, and to actively obtain proper permitting to allow commencement and completion of this project in a timely manner. Let us not forget that this project has been in the works since 1994. It is time we take the necessary steps to finish it, and I believe since you have taken over the project, you have embraced the need to move forward. I trust you will continue to keep our much needed channel project in front of the right people to continue on a positive path.

Enclosed please find our proposed mitigation and disposal plan, which is the most agreeable and generous offer we can make to integrate our available resources and community. It is our intention to work with the Army Corps to develop a plan incorporating our joint ideas before submitting a final version to the appropriate agencies.

We have a ten-year awareness that the federal wheels of progress move slowly and sometimes not at all. This is why it is imperative to have your rapid and best efforts to review this information and meet with us (either in person or by phone conference) to complete an acceptable and final plan to submit to the various agencies.

Our intent is to have a clearly developed plan that we can subjec1tively stand behind, as well as pass the scrutiny of the various agencies, which must approve it before moving on to final engineering and design. These agencies have informally told us what they want, and we have incorporated those needs into this plan. The various agencies made it clear at our semi-final planning session held in Tampa on January 30, 2004, that this is what it will take for this project to be completed. We hope you and James can now make the budget fit the plan. With some of the recent changes you recently shared with me, I believe you can. Pat Fagan and I look forward to hearing from you soon with your thoughts on our joint and final draft.

Following are Hernando County's nine final recommendations for comprehensive channel completion, mitigation, and disposal of debris for the Hernando Beach Channel Project.

1) **Relocate the turning basin** from where it was originally proposed Oust west of the Hernando Beach Clubhouse) approximately 200-300 yards north so it lines up with the main channel coming out from the boat ramp. This action minimizes damage to existing grass beds and brings the turning basin closer to the existing main channel. It reduces dredging (a direct cost savings) due to both deeper starting depths and the ability to follow part of the current channel rather than digging new ground across a very shallow expanse. We estimate @ 3 acres less sea grass damage to a very lush bed near shore and @ 5 more acres of sparsely populated seabed traversing the shallow area mentioned above.

To see a visual of this please refer to *Illustration Page* 1- *Turning Basin & Channel Re-positioning* of the accompanying photographs and charts. You can see the original planned turning basin as indicated by the green box labeled # 1. The suggested location to minimize damage is indicated by green box labeled # 2. The lines radiating out from each box indicates the suggested channel dig in order to eliminate blind turns. The green line following the existing channel along the area called Coon Key is the planned direction, the least cos1tly, and the least damaging to existing sea bottom. (We realize Army Corps has already changed the plan to meet this suggestion, but it should be included in our final changes to DEP and NOM to gain mitigation credit.)

*Illustration page* 2 represents a sketch chart enabling you to see the areas shown in photo #1 more clearly. This should give particular clarity to the large amount of seabed and sea grass damage that will be avoided by moving the turning basin.

2) **Prop Scar Re-generation Areas** encompass many of the areas we have observed damaged by propellers *Illustration page* 3. The worst damage was found in and around the western edge of the developed Hernando Beach community, and continuing out along the channel edge following Coon Key. These areas represent 114.4 acres of protection zone and will be posted by signs placed by the Hernando County Port Authority. These postings will be written in language as directed by DEP or NOAA, but will, in effect denote environmentally sensitive areas as well as inform/educate the boating public of areas to be avoided. Note that in *Illustration* 3 corridors are intentionally left open between some of the posted areas to allow boaters to use naturally occurring channels that can be traversed safely at certain tides. This will also reduce concerns by boaters of being "over restricted". In addition, these natural channels can be productive fishing areas for inshore boaters and we therefore should not restrict them from public use. The markers will make it easier for safe passage without damage because they will indicate the correct path to follow rather than leaving boaters to guess and/or miss the best path as they often do now.

3) **Speed zones** will be implemented to restrict the speed of vessels in and around the developed areas of Hernando Beach. Signs will be, posted and placed by the Hernando Beach Port Authority indicating "slow speed"', "no wake", or "minimum wake". The obvious advantages are safer passages for boaters through the blind curves and most populated areas of the channel, less undermining of existing seawalls, reduced erosion of undeveloped properties, al1d reduced turbulence and accidental groundings directly affecting the surrounding sea grass beds. *Illustration Pages* 6 *and* 7 show the areas and details for slow speed zones covering a total of 2.5 nautical miles of our near shore waterways.

4) **Manatee protection zones** are long overdue and have never been implemented in or around Hernando Beach even though manatees often frequent our canals and creeks *(see Illustration Page* 8). As part of our channel project mitigation plan, we intend to place manatee zones around not only several miles of Minnow Creek indicated by photo # 9 (272.3 acres) but also an expanded area of 2,778.6 acres around Bay Port *(see Illustration Pages* 9 *and 10).* This designates a total of 3,050.90 acres for manatee protection. These zones will be clearly visible with signs indicating the time of year to maintain extra vigilance for these slow moving creatures, and will also require reduced speeds during the months of Nov. through March. The advantages to the manatees are less interaction with boats that will lessen the chance of injury, sickness or death. This action will also provide manatees with a less disturbed environment, perhaps allowing for more natural mating practices (observed by many along our shores) and the ensuing birth and nurturing of new offspring.

5) **Re-locate the current western channel end slightly north** over the submerged spoil islands in order to use sea bottom that has already been damaged previously and minimize damage to virgin sea bottom to the South. We feel it is sensible planning that when widening the western terminus of the current channel, it be dug from the center and widened to the north rather than digging from the center and widening to the south. This leaves the existing southern shallows, the southern slope, and existing sea grass found in those areas undisturbed. Additionally, we effectively eliminate the dangerous and barely submerged spoil islands that have a local history of maritime disasters. See *Illustration* Page 11 for details. As estimated by James on one of our recent calls, the cost is small, (@ $100,000) but the reduction of mitigation and good will this action provides is large.

6) **Mitigation and disposal plan** will be a combination of pumping debris to the quarry west of Shoal Line Blvd, and disposing of larger rock at an acceptable location.

It has been said that debris removal is the single biggest killer of this project. Removal can only be accomplished in two ways: by drag lining materials out and dumping the debris somewhere in the Gulf of Mexico, or by dredging and simultaneously pumping the debris to a holding area or filling in a previously damaged area. The difference in cost is small, but it is enough to kill the project. It is the Army Corps idea to dump all debris into the Gulf of Mexico, and they feel it is less expensive than dredging and pumping it to an old quarry a reasonable and attainable distance from the dredge site. This second option is the first choice of DEP and NOAA, and Hernando County's first preference as well. However, we believe pumping to a closer area of the quarry than previously suggested can reduce costs enough to make pumping feasible. See *Illustration Page* 12 *-Dredge Pipeline.* We believe that a combination of dredging and pumping would end up in the long run as being the most cost effective, environmentally friendly, and least embattled method of getting both the job done and getting mitigation credit as well.

DEP has agreed that we can dump rock out on Richardson's reef as long as we submit to them a "separation plan". I believe that if we combine pumping sand and smaller rock to the Quarry, and dump the larger rock out on the reef we can automatically satisfy the separation plan needed by DEP. In addition, the number of trips out to the reef would be reduced if we were only hauling the larger rocks. We will seek agreement to a closer dump sight than Richardson's reef before Army Corps and we finalize our plans for submission to the agencies. In pursuing "pumping/dumping" combination, you automatically have a separation plan that the concerned agencies have already agreed is acceptable, and the disposal of the larger rocks, may in time improve fishing at a reasonably close reef area. Let's make this the plan, let's all get behind it and have Army Corps fight for us to complete it.

7) **Plant trees** on select spoil islands and black mangroves around them (on the back side). This will involve the entire community. Advantages of doing this will be to prevent erosion, create fish, crustacean, and bird habitat, and improve nesting areas. These plants will replace Australian pines that had previously gotten a foothold on these islands, and promote a more natural transition from land to sea. This will be organized in cooperation with Hernando County Parks and Recreation, and the local Port authority, as well as concerned citizens of Hernando County. See *Illustration Page* 13 *-Planting Areas.* Since this portion of the mitigation plan is entirely voluntary, we believe it can be part of the mitigation, but need not be included in cost estimates. There is no way to value complete volunteerism.

8) **Shorten the channel extension by @ 2/10 mi.** As previously discussed, we will have the appropriate people within our county provide information on 6 foot depth contours found to be closer to shore than originally shown on the Army Corps plan. This will equate directly to cost savings for dredging, but will also minimize any additional damage to sea bottom. Above everything else we have offered this allows 84,480 square feet of saved seabed.

9) Last, but certainly not least, is **narrowing the channel** from it's original 80 foot width to 75 feet wide the entire length. The cost savings from this and #8 above could allow for all of the other mitigation ideas needed in our plan.

Army Corps agreement to make the channel narrower and slightly shorter along with offering to consider moving the western end of the existing channel north over the submerged spoil islands has provided us with forward progress to make this project feasible at long last, and we thank you for your efforts. I look forward to hearing from you and James so we can complete our final plan for submission.

Additional comments:

On February 25, 2004, I had a conversation with Rose Poyner of DEP. Rose believes DEP would have no problem if we pump sand and smaller rocks into the quarry, and place larger rocks on selected spoil islands as long as we don't widen or lengthen the islands. In other words, the rock must be placed on top of spoil islands so they don't spillover into the existing channel or surrounding seabeds, and don't create silt runoff. This could be a cost savings of considerable proportions (compared to hauling it out to the reef) as long as we don't have too much rock for the usable islands to hold. DEP would only need the length and width of the islands we intend to use so they can agree they are large enough for our purposes. I will provide you with this data soon.

As for your inquiry about leaving sand in the bottom of the channel, Rose feels as long as we don't expect mitigation credit and the turbidity can be kept to levels so as not to damage surrounding sea grasses from drift off sediments, they might agree to allow it. I have my doubts if we could do it without creating massive turbidity problems, but if you and James can provide a plan to them showing how it can be done, then I believe they will work with you.

DEP applauds your decision to make the channel 5 feet less in width, and appreciates your willingness to consider moving the existing western channel end north over the submerged spoil islands, as well as the possible shortening of the channel length. Because of this they are attempting to work with us on these other areas to do something in return. They have requested that in our final plan, James provide them with the estimated amounts of actual sea grasses that will be saved by (1) making the channel narrower, (2) moving the turning basin to the north, (3) moving the western end of the existing channel over the submerged spoil islands, and (4) shortening the channel by 2/10 of a mile as proposed. These figures will allow DEP to be more accurate in ascertaining the amount of mitigation needed for compensation.

I recently saw a detailed sea grass study the Army Corps did in and around the Hernando Beach Channel. Perhaps you could use that to provide the figures needed by DEP. This is very important to them so we must be sure to include the computations in our submitted plans. Rose made it clear to me that our submission of this "Final Plan" will not get official final approval until Army Corps submits it with the proper permits. However, they will be able to tell us if it is an "acceptable" plan, and if it would get a "probable or not probable" green light.

Once we provide DEP with proper documentation on our end, they will move for official final approval, and then must allow 24 days for any third parties to object. She said she didn't anticipate any objections from outside parties. She also said that Army Corps should be aware of these standard procedures and how to prepare for them. Obviously, if you need additional clarification on any of this you would be well advised to contact Rose. She has been quite forthcoming and helpful in creating a path for us to follow.

Rose's only concern (as was Mark Sramek's) was that our plans don't allow for any sea bottom restoration. She had hoped that we could accomplish this with the filling up of the incomplete canal just west of Hernando Beach South. However, once I explained to her the minimal dimensions we discovered during our survey and the damage to the current ecosystem that would result, she agreed with me that the bene1nts would not outweigh the other damage that would most likely occur. In addition, I brought to her attention that the reason we cannot restore sea bottom in the area is because we have done so little damage to our coastline over the years. Because of that, it is difficult to find areas to restore. That in itself is a testimony to our efforts to keep our area as pristine and natural as possible. She agreed. It is because we have so few areas to restore, they are working with us on a combination of ideas to make up our mitigation, minimization, and disposal plan. Armed with this additional information, we will surely be able to put a viable plan on the table for final approval.

Please keep in mind that these proposals will be reviewed by the Hernando Board of County Commissioners at an upcoming meeting near the end of March. It would be helpful to know what your recommendations are prior to that date so we can be more definitive in what we present as our "final proposal".

Thank you for working with us,

Frank a Santo

Frank Santo
Acting Marine Biologist and
Project Coordinator, Hernando County
cc: Pat Fagan

# Figures

## 3. Assessment Forms (Florida Uniform Mitigation Assessment Method)

Part I - Qualitative Description

- Navigation Channel
- Tidal Creek (Manatee Slow Speed Zone)
- Artificial Reef Site
- Lake/Borrow Pit
- Prop Scar Area

Part II - Quantification of Assessment Area

- Navigation Channel (Initial Impacts)
- Navigation Channel (Seagrass Recovery)
- Prop Scar Area
- Artificial Reef Site
- Lake/Borrow Pit
- Tidal Channel (Manatee Slow Speed Zone)

Part III - Mitigation Determination Formulas (see Summary Table referenced below)

Summary Table of Impacts and Mitigation

**PART I – Qualitative Description**
**(See Section 62-345.400, F.A.C.)**

| Site/Project Name | Application Number | Assessment Area Name or Number |
|---|---|---|
| Hernando Beach Navigation | | Navigation Channel |

| FLUCCs code | Further classification (optional) | Impact or Mitigation Site? | Assessment Area Size |
|---|---|---|---|
| | | Impacted Channel & a Mitigation Site | 40 acres (22 acres seagrass) |

| Basin/Watershed Name/Number | Affected Waterbody (Class) | Special Classification (i.e.OFW, AP, other local/state/federal designation of importance) |
|---|---|---|
| Gulf of Mexico | | |

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands
Navigation channel on Gulf of Mexico

Assessment area description
Shallow navigation channel with about 60% seagrass. Remainder is rocky substrate or shifting sands.

| Significant nearby features | Uniqueness (considering the relative rarity in relation to the regional landscape.) |
|---|---|
| Artificial Reef within a few miles. Commercial and sports fisheries in the area. | Seagrass and oyster reef fairly common in the area. Marsh grass areas common. Minor mangrove component. |

| Functions | Mitigation for previous permit/other historic use |
|---|---|
| Provides habitat for various life stages of fish and shellfish. Habitat for manatee. Seagrass and algae communities. | None |

| Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found.) | Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) |
|---|---|
| Commercial and sports fishery species supported. | Habitat for Manatee (endangered) and Dolphin (protected as a marine mammal). Essential Fish Habitat for managed species shrimp (brown shrimp, *Penaeus aztecus;* white shrimp, *Penaeus setiferus;* pink shrimp, *Penaeus duorarum*) and red drum, *Sciaenops ocellatus*) * |

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):
Seagrass, algae, and oyster reef present. Seagrass inventoried. Commercial and sports fishery throughout the general area. Manatee and Dolphin observations reported.

Additional relevant factors: Since seagrass is in the existing channel, it is likely that it will recover to some degree following the dredging event. Dredging may reduce the extent of suitable sandy bottom and increased depth would tend to reduce light penetration to the bottom.

| Assessment conducted by: | Assessment date(s): |
|---|---|
| | |

Form 62-345.900(1), F.A.C. [ effective date ]

* Species Managed by the Gulf of Mexico Fishery Management Council, National Marine Fisheries Service. Area Considered Essential Fish Habitat pursuant to the Magnuson-Stevens Fishery Conservation and Management Act

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**PART I – Qualitative Description**
**(See Section 62-345.400, F.A.C.)**

| Site/Project Name | Application Number | Assessment Area Name or Number |
|---|---|---|
| Hernando Beach Navigation | | Tidal Creek |

| FLUCCs code | Further classification (optional) | Impact or Mitigation Site? | Assessment Area Size |
|---|---|---|---|
| | | a Mitigation Site (see Figures 1 & 3) | 80 acres |

| Basin/Watershed Name/Number | Affected Waterbody (Class) | Special Classification (i.e.OFW, AP, other local/state/federal designation of importance) |
|---|---|---|
| Gulf of Mexico | | |

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands
Tidal Creek on Gulf of Mexico

Assessment area description
Tidal Creek with relatively undeveloped surroundings.

| Significant nearby features | Uniqueness (considering the relative rarity in relation to the regional landscape.) |
|---|---|
| Seagrass, Mangrove, tidal marsh, oyster beds | Tidal creeks are fairly common in the area. Relatively undeveloped ones are becoming more rare. |

| Functions | Mitigation for previous permit/other historic use |
|---|---|
| Provides habitat for various life stages of fish and shellfish. Habitat for manatee. Seagrass, algae communities, and oyster beds present. | None |

| Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found.) | Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) |
|---|---|
| Commercial and sports fishery species supported. | Manatee (endangered) use. Dolphin (marine mammal). See also the managed species for the navigation channel (above) and for reef (below). |

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):
Seagrass, algae, and oyster reef present. Seagrass inventoried. Commercial and sports fishery throughout the general area. Manatee and Dolphin observations reported.

Additional relevant factors: Proposed speed zone would reduce risk of injury to manatees which are known to use the area. Amount of habitat improvement would be rather small on a per acre basis. However, a fairly large area would benefit (80 acres). This mitigation measure relates to the project impact in that manatee use is an important function of seagrass areas.

| Assessment conducted by: | Assessment date(s): |
|---|---|
| | |

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**PART I – Qualitative Description**
**(See Section 62-345.400, F.A.C.)**

| Site/Project Name | Application Number | Assessment Area Name or Number |
|---|---|---|
| Hernando Beach Navigation | | Artificial Reef Site (see fig. 4) |

| FLUCCs code | Further classification (optional) | Impact or Mitigation Site? | Assessment Area Size |
|---|---|---|---|
| | | Mitigation | 27 acres |

| Basin/Watershed Name/Number | Affected Waterbody (Class) | Special Classification (i.e.OFW, AP, other local/state/federal designation of importance) |
|---|---|---|
| Gulf of Mexico | | |

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands
Off-shore of Navigation channel and dredging area

Assessment area description
Currently a relatively featureless sandy bottom.

| Significant nearby features | Uniqueness (considering the relative rarity in relation to the regional landscape.) |
|---|---|
| Artifical Reef (Richardson Reef) located nearby. | Reef and hardbottom at this depth relatively rare. Presumed needed habitat for larger fish. |

| Functions | Mitigation for previous permit/other historic use |
|---|---|
| Sports fishery resource. Habitat for larger fish. | None at this particular location. |

| Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found.) | Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) |
|---|---|
| Likely use by Species of Grouper, Snapper, Octopus, and other species associated with rock habitat. | Managed Species*: reef fish (red grouper, gag grouper, scamp grouper, red snapper, gray snapper, yellowtail snapper, lane snapper, greater amberjack, lesser amberjack, tilefish, and gray triggerfish) |

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):
With the nearby Richardson Reef, proposed action would provide additional artificial reef. In addition to the fin fish listed above, the area would have potential to benefit certain invertebrates (shrimp, crab, and lobster). As a scarce resource, additional reef would enhance the area's ecosystem richness or diversity (the seagrass, marshgrass, mangrove, tidal creek, oyster bar complex).

Additional relevant factors: For the purposes of "out-of-kind" mitigation, the artificial reef would compare to sea grass habitat. For calculation purposes, an acre of artificial reef is assumed to equal about 0.32 acres of sea grass with respect to ecosystem services. A number of species found on the reef utilize seagrass areas during some stage of their life (i.e., larvae and juvenile of gag grouper and gray snapper).

| Assessment conducted by: | Assessment date(s): |
|---|---|
| | |

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* Species Managed by the Gulf of Mexico Fishery Management Council, National Marine Fisheries Service. Area Considered Essential Fish Habitat pursuant to the Magnuson-Stevens Fishery Conservation and Management Act

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**PART I – Qualitative Description**
**(See Section 62-345.400, F.A.C.)**

| Site/Project Name | Application Number | Assessment Area Name or Number |
|---|---|---|
| Hernando Beach Navigation | | Lake/Borrow pit (see Fig. 1) |

| FLUCCs code | Further classification (optional) | Impact or Mitigation Site? | Assessment Area Size |
|---|---|---|---|
| | | mitigation | 2.9 acres |

| Basin/Watershed Name/Number | Affected Waterbody (Class) | Special Classification (i.e.OFW, AP, other local/state/federal designation of importance) |
|---|---|---|
| | | |

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Freshwater lake/borrow pit located inland of dredging project. Groundwater dominated with some above ground inflow/outflow during wet periods.

Assessment area description

Borrow pit excavated to below zone of good light penetration. Extent of submerged and emergent aquatic vegetation limited by excessive depth. Potential for anoxic waters at the deeper level.

| Significant nearby features | Uniqueness (considering the relative rarity in relation to the regional landscape.) |
|---|---|
| | Several lakes/borrow pits in the area. The extent of littoral zones with submerged aquatic vegetation and/or productive benthic habitat is limited. |

| Functions | Mitigation for previous permit/other historic use |
|---|---|
| Overall productivity and suitability for fish and wildlife is limited by excessive depth. | NONE |

| Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found.) | Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) |
|---|---|
| Establishment of areas that support submerged aquatic vegetation and littoral communities (emergent aquatic vegetation) would support life stages of a variety of fish and aquatic invertebrates. Expect use also by birds, reptiles, and amphibians. | Use by protected species uncertain. |

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Additional relevant factors: For the purposes of “out-of-kind” mitigation, the lake/borrow pit would have less wetland value than sea grass habitat. An acre of restored lake/borrow pit is assumed to equal about 0.45 acres of sea grass with respect to ecosystem services. While this action would provide benefits to water quality and fish/wildlife resources, its connection with the project impacts is less direct than the other mitigation features. This feature would be largely out-of-kind mitigation.

| Assessment conducted by: | Assessment date(s): |
|---|---|
| | |

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**PART I – Qualitative Description**
**(See Section 62-345.400, F.A.C.)**

| Site/Project Name | Application Number | Assessment Area Name or Number |
|---|---|---|
| Hernando Beach Navigation | | Prop Scar Area (see Fig. 2) |

| FLUCCs code | Further classification (optional) | Impact or Mitigation Site? | Assessment Area Size |
|---|---|---|---|
| | | Mitigation | 114 (20 acres seagrass) |

| Basin/Watershed Name/Number | Affected Waterbody (Class) | Special Classification (i.e.OFW, AP, other local/state/federal designation of importance) |
|---|---|---|
| Gulf of Mexico | | |

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands
These are shallower areas around the navigation channel which show signs of prop scarring in the seagrass beds.

Assessment area description
Approximately 20 acres of the 114 are seriously impacted by prop scarring.

| Significant nearby features | Uniqueness (considering the relative rarity in relation to the regional landscape.) |
|---|---|
| The seagrass beds provide habitat for a number of species in various life stages. | Seagrass is a fairly common natural resource in the area. Seagrass is considered very productive and provides food and habitat for an abundance of marine/estuarine species. |

| Functions | Mitigation for previous permit/other historic use |
|---|---|
| Seagrass is highly productive. It supports an abundance of marine/estuarine species. It tends to stabilize the bottom, trap sediments, and improve water quality | NONE |

| Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found.) | Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area) |
|---|---|
| A great many species in various life stages utilize seagrass habitat. Seagrass is very productive. | Seagrass meadows provide food and refuge for manatees. See earlier sheet on seagrass for additional species (managed species and essential fish habitat). |

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):
See earlier sheet on the project impacts concerning seagrass habitat.

Additional relevant factors: Any limiting of boat traffic through this area would reduce damage to seagrass. It would reduce or possibly reverse the damage to sea grass through prop scaring. Of the mitigation features proposed, this (along with seagrass recovery in the channel) would provide the benefit most closely related to the project impacts (fully in-kind mitigation). Other features provide various levels of synergistic benefits (overall ecosystem diversity and richness with man-made reef), benefits to specific components of the impacted area (i.e., manatee), or out-of-kind benefits (freshwater littoral and sub-littoral habitat).

| Assessment conducted by: | Assessment date(s): |
|---|---|
| | |

## PART II – Quantification of Assessment Area (impact or mitigation)
**(See Sections 62-345.500 and .600, F.A.C.)**

| Site/Project Name | Application Number | Assessment Area Name or Number |
|---|---|---|
| Hernando Beach Navigation Channel | | Navigation Channel |
| **Impact or Mitigation** | **Assessment conducted by:** | **Assessment date:** |
| Impact (before vs right after dredging) | | |

| Scoring Guidance | Optimal (10) | Moderate(7) | Minimal (4) | Not Present (0) |
|---|---|---|---|---|
| The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed | Condition is optimal and fully supports wetland/surface water functions | Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions | Minimal level of support of wetland/surface water functions | Condition is insufficient to provide wetland/surface water functions |

| | | w/o pres or current | with |
|---|---|---|---|
| .500(6)(a) Location and Landscape Support | Location and Landscape Support are good and would not be much changed by the project. | 7 | 7 |
| .500(6)(b)Water Environment (n/a for uplands) | Currently in the channel, water depth and light penetration are sufficient to support seagrass but is somewhat less than optimal.<br><br>Dredging the channel would increase water depth and decrease light penetration. Light penetration is expected to be sufficient to support seagrass but to a lesser extent than currently. | 7 | 5 |
| .500(6)(c)Community structure<br>1. Vegetation and/or<br>2. Benthic Community | Currently, about 60% (22 acres) of the channel contains seagrass.<br><br>Initially after dredging most (if not all) of the seagrass would be removed. Dredging the channel would result in deepening the channel by a couple feet (with somewhat reduced light penetration to the bottom). In addition, extent of sandy bottom areas would be at least temporarily reduced. | 7 | 0 |

| Score = sum of above scores/30 (if uplands, divide by 20) | current or w/o pres | with |
|---|---|---|
| | 0.70 | 0.40 |

| If preservation as mitigation, |
|---|
| Preservation adjustment factor = |
| Adjusted mitigation delta = |

| For impact assessment areas | |
|---|---|
| FL = delta x acres = | 0.30 X 22 = 6.60 |

| Delta = [with-current] |
|---|
| 0.30 |

| If mitigation |
|---|
| Time lag (t-factor) = |
| Risk factor = |

| For mitigation assessment areas |
|---|
| RFG = delta/(t-factor x risk) = |



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## PART II – Quantification of Assessment Area (impact or mitigation)
**(See Sections 62-345.500 and .600, F.A.C.)**

| Site/Project Name | Application Number | Assessment Area Name or Number |
|---|---|---|
| Hernando Beach Navigation Channel | | Navigation Channel |
| Impact or Mitigation: Mitigation (seagrass recovery) | Assessment conducted by: | Assessment date: |

| Scoring Guidance | Optimal (10) | Moderate(7) | Minimal (4) | Not Present (0) |
|---|---|---|---|---|
| The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed | Condition is optimal and fully supports wetland/surface water functions | Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions | Minimal level of support of wetland/surface water functions | Condition is insufficient to provide wetland/surface water functions |

| | | | |
|---|---|---|---|
| .500(6)(a) Location and Landscape Support | w/o pres or current: 7 | with: 7 | Location and Landscape Support are good and would not be much changed by the project. |
| .500(6)(b)Water Environment (n/a for uplands) | w/o pres or current: 5 | with: 6 | After dredging, water quality should return to about that before dredging. The additional depth would slightly reduce light penetration to the bottom. |
| .500(6)(c)Community structure<br>1. Vegetation and/or<br>2. Benthic Community | w/o pres or current: 0 | with: 4 | Upon completion of dredging most (if not all) of the seagrass will be removed.<br><br>Over time, seagrass will recover to some extent. Seagrass is expected to recover to about 50% of the pre-project condition in about 5 years. After dredging, sand and sediment will begin to accumulate in some areas but probably not to the extent before dredging. |

| Score = sum of above scores/30 (if uplands, divide by 20) | | If preservation as mitigation, | For impact assessment areas |
|---|---|---|---|
| current or w/o pres: 0.40 | with: 0.57 | Preservation adjustment factor = | FL = delta x acres = |
| Delta = [with-current]: 0.17 | | Adjusted mitigation delta = | |
| | | If mitigation<br>Time lag (t-factor) = 1.14<br>Risk factor = 1 | For mitigation assessment areas<br>RFG = delta/(t-factor x risk) = 0.15 |



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* seagrass benefit would be 0.15 X 22 acres = 3.30 seagrass acres

*

## PART II – Quantification of Assessment Area (impact or mitigation)
**(See Sections 62-345.500 and .600, F.A.C.)**

| Site/Project Name | Application Number | Assessment Area Name or Number |
|---|---|---|
| Hernando Beach Navigation Channel | | Prop scar area |
| Impact or Mitigation: Mitigation (prop scar recovery) | Assessment conducted by: | Assessment date: |

| Scoring Guidance | Optimal (10) | Moderate(7) | Minimal (4) | Not Present (0) |
|---|---|---|---|---|
| The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed | Condition is optimal and fully supports wetland/surface water functions | Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions | Minimal level of support of wetland/surface water functions | Condition is insufficient to provide wetland/surface water functions |

| | | w/o pres or current | with |
|---|---|---|---|
| .500(6)(a) Location and Landscape Support | Location and Landscape Support for this area is good and not likely to much change with the reduction in boat traffic. | 7 | 7 |
| .500(6)(b)Water Environment (n/a for uplands) | Existing water quality is good.<br><br>Reduction in boat traffic may reduce the temporary and localized increase in turbidity and sedimentation. | 7 | 8 |
| .500(6)(c)Community structure<br>1. Vegetation and/or<br>2. Benthic Community | About 20 acres (of the 114 acre site) is seriously impacted with prop scars.<br><br>Reduction in boat traffic would likely reduce the rate of further injury to seagrass and may result in recovery. Proposed action would improve seagrass habitat over the without-project condition. Substantial amount of these improvements would accrue within 5 years. | 2 | 7 |

| Score = sum of above scores/30 (if uplands, divide by 20) | current or w/o pres | with |
|---|---|---|
| | 0.53 | 0.73 |

| If preservation as mitigation, |
|---|
| Preservation adjustment factor = |
| Adjusted mitigation delta = |

| For impact assessment areas |
|---|
| FL = delta x acres = |

| Delta = [with-current] |
|---|
| 0.20 |

| If mitigation | |
|---|---|
| Time lag (t-factor) = | 1.14 |
| Risk factor = | 2 |

| For mitigation assessment areas | |
|---|---|
| RFG = delta/(t-factor x risk) = | 0.09 * |

* seagrass benefit would be 0.09 X 20 acres = 1.75 seagrass acres



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## PART II – Quantification of Assessment Area (impact or mitigation)
**(See Sections 62-345.500 and .600, F.A.C.)**

| Site/Project Name | Application Number | Assessment Area Name or Number |
|---|---|---|
| Hernando Beach Navigation Channel | | Artificial Reef Site |
| **Impact or Mitigation** | **Assessment conducted by:** | **Assessment date:** |
| Mitigation (create artificial reef) | | |

| Scoring Guidance | Optimal (10) | Moderate(7) | Minimal (4) | Not Present (0) |
|---|---|---|---|---|
| The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed | Condition is optimal and fully supports wetland/surface water functions | Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions | Minimal level of support of wetland/surface water functions | Condition is insufficient to provide wetland/surface water functions |

| | | w/o pres or current | with |
|---|---|---|---|
| .500(6)(a) Location and Landscape Support | Area proposed for rock placement for artificial reef is largely a featureless sandy bottom.<br><br>The 27 acre reef would be made of natural limestone rock excavated from the channel. Reef would provide habitat for a number of species and improve overall diversity in the area. Hardgrounds of this relief are not abundant in the area. This feature would provide diversity and add to | 1 | 7 |
| .500(6)(b)Water Environment (n/a for uplands) | Water quality, currents, waves, and other physical/chemical characteristics are suitable for artificial reef and would not be much changed by the reef. | 7 | 7 |
| .500(6)(c)Community structure<br>1. Vegetation and/or<br>2. Benthic Community | Seagrass is not present. Other attached organisms are rare at the present time.<br><br>While the artificial reef would not support seagrass, it would provide shelter for various species and a substrate for attached organisms. | 1 | 7 |

| Score = sum of above scores/30 (if uplands, divide by 20) | current or w/o pres | with |
|---|---|---|
| | 0.30 | 0.70 |

| If preservation as mitigation, |
|---|
| Preservation adjustment factor = |
| Adjusted mitigation delta = |

| For impact assessment areas |
|---|
| FL = delta x acres = |

| Delta = [with-current] |
|---|
| 0.40 |

| If mitigation | |
|---|---|
| Time lag (t-factor) = | 1.14 |
| Risk factor = | 1 |

| For mitigation assessment areas | |
|---|---|
| RFG = delta/(t-factor x risk) = | 0.35 * |

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* seagrass benefit equivalent would be 0.35 X 27 reef acres X 0.32 conversion = 2.99 seagrass

## PART II – Quantification of Assessment Area (impact or mitigation)
**(See Sections 62-345.500 and .600, F.A.C.)**

| Site/Project Name | Application Number | Assessment Area Name or Number |
|---|---|---|
| Hernando Beach Navigation Channel | | Lake/borrow Pit |
| **Impact or Mitigation** | **Assessment conducted by:** | **Assessment date:** |
| Mitigation (raise bottom elevation) | | |

| Scoring Guidance | Optimal (10) | Moderate(7) | Minimal (4) | Not Present (0) |
|---|---|---|---|---|
| The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed | Condition is optimal and fully supports wetland/surface water functions | Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions | Minimal level of support of wetland/surface water functions | Condition is insufficient to provide wetland/surface water functions |

| | | w/o pres or current | with |
|---|---|---|---|
| .500(6)(a) Location and Landscape Support | The lakes/borrow pits inland of Hernando Beach are largely too deep to support littoral and sublittoral vegetation.<br><br>The placement of dredged material would provide an estimated 2.9 acres of littoral and sublittoral habitat that would support submerged and emergent vegetation. It would provide shelter for smaller aquatic organisms and the earlier life stages of larger aquatic organisms. | 2 | 7 |
| .500(6)(b)Water Environment (n/a for uplands) | Deeper waters of these lakes/borrow pits are subject to anoxic conditions.<br><br>The raising of bottom elevation to within the photic zone would improve habitat for a number of organisms and especially benefit earlier life stages. | 1 | 7 |
| .500(6)(c)Community structure<br><br>1. Vegetation and/or<br>2. Benthic Community | Currently the benthic communities of the lakes/borrow pits do not receive enough sunlight to support vegetation and are ooze communities subject to anoxic conditions from time to time.<br><br>The raising of the bottom elevation on the 2.9 acres with dredged material would provide opportunity for light penetration to the bottom and reduce the potential for anoxic conditions. Substantial benefits should accrue in about 5 years. | 1 | 7 |

| Score = sum of above scores/30 (if uplands, divide by 20) | current or w/o pres | with |
|---|---|---|
| | 0.13 | 0.70 |

| Delta = [with-current] |
|---|
| 0.57 |

| If preservation as mitigation, |
|---|
| Preservation adjustment factor = |
| Adjusted mitigation delta = |

| If mitigation | |
|---|---|
| Time lag (t-factor) = | 1.14 |
| Risk factor = | 1 |

| For impact assessment areas |
|---|
| FL = delta x acres = |

| For mitigation assessment areas | |
|---|---|
| RFG = delta/(t-factor x risk) = | 0.50 * |



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* seagrass benefit equivalent would be 0.50 X 2.9 lake acres X 0.45 conversion = 0.65 seagrass acres

## PART II – Quantification of Assessment Area (impact or mitigation)
**(See Sections 62-345.500 and .600, F.A.C.)**

| Site/Project Name | Application Number | Assessment Area Name or Number |
|---|---|---|
| Hernando Beach Navigation Channel | | tidal channel north of project |
| Impact or Mitigation: Mitigation (manatee speed zone) | Assessment conducted by: | Assessment date: |

| Scoring Guidance | Optimal (10) | Moderate(7) | Minimal (4) | Not Present (0) |
|---|---|---|---|---|
| The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed | Condition is optimal and fully supports wetland/surface water functions | Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions | Minimal level of support of wetland/surface water functions | Condition is insufficient to provide wetland/surface water functions |

| | | w/o pres or current | with |
|---|---|---|---|
| .500(6)(a) Location and Landscape Support | 80 acre tidal channel south of project is frequented by manatees. Proposal is to establish a slow speed zone in this area (see attached aerial photo).<br><br>Slow speed zone would reduce risk of boat injury to manatees. | 7 | 8 |
| .500(6)(b)Water Environment (n/a for uplands) | Little or no change in water environment anticipated. | 7 | 7 |
| .500(6)(c)Community structure<br>1. Vegetation and/or<br>2. Benthic Community | Little or no change in vegetation or community structure anticipated. | 7 | 7 |

| Score = sum of above scores/30 (if uplands, divide by 20) | current or w/o pres | with |
|---|---|---|
| | 0.67 | 0.70 |

| Delta = [with-current] |
|---|
| 0.03 |

| If preservation as mitigation, |
|---|
| Preservation adjustment factor = |
| Adjusted mitigation delta = |

| If mitigation | |
|---|---|
| Time lag (t-factor) = | 1 |
| Risk factor = | 1 |

| For impact assessment areas |
|---|
| FL = delta x acres = |

| For mitigation assessment areas | |
|---|---|
| RFG = delta/(t-factor x risk) = | 0.03 * |

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* seagrass benefit equivalent would be 0.03 X 80 acres X 0.5 conversion = 1.20 seagrass acres

**Mitigation Determination Formulas**
**(See Section 62-345.600(3), F.A.C.)**

For each impact assessment area:
**(FL)** Functional Loss = Impact Delta X Impact acres

For each mitigation assessment area:
**(RFG)** Relative Functional Gain = Mitigation Delta (adjusted for preservation, if applicable)/((t-factor)(risk))

**(a) Mitigation Bank Credit Determination**

The total potential credits for a mitigation bank is the sum of the credits for each assessment area where assessment area credits equal the RFG times the acres of the assessment area scored

| Bank Assessment Area | RFG | X | Acres | = | Credits |
|---|---|---|---|---|---|
| example | | | | | |
| a.a.1 | | | | | |
| a.a.2 | | | | | |
| **total** | | | | | |

**(b) Mitigation needed to offset impacts, when using a mitigation bank**

The number of mitigation bank credits needed, when the bank or regional offsite mitigation area is assessed in accordance with this rule, is equal to the summation of the calculated functional loss for each impact assessment area.

| Impact Assessment Area | FL | = | Credits needed |
|---|---|---|---|
| example | | | |
| a.a.1 | | | |
| a.a.2 | | | |
| **total** | | | |

**(c) Mitigation needed to offset impacts, when not using a bank**

To determine the acres of mitigation needed to offset impacts when not using a bank or a regional offsite mitigation area as mitigation, divide functional loss (FL) by relative functional gain (RFG). If there are more than one impact assessment area or more than one mitigation assessment area, the total functional loss and total relative functional gain is determined by summation of the functional loss (FL) and relative functional gain (RFG) for each assessment area.

| | FL | / | RFG | = | Acres of Mitigation |
|---|---|---|---|---|---|
| example | | | | | |
| a.a.1 | | | | | |
| a.a.2 | | | | | |
| **total** | | | | | |

See attached spreadsheet for summary of impacts and mitigation.

HERNANDO BEACH NAVIGATION CHANNEL

Impacts and Mitigation, Florida Uniform Mitigation Assessment Method

| Description | Acres | Time Delay | Time Factor | Risk Factor | Delta (Lift) | Seagrass * Conversion | Habitat Units * |
|---|---|---|---|---|---|---|---|
| Initial Project Impacts | 22 | 0 | 1 | 1 | -0.30 | 1.00 | -6.60 |
| Seagrass Recovery | 22 | 5 | 1.14 | 1 | 0.17 | 1.00 | 3.28 |
| Prop Scar Recovery | 20 | 5 | 1.14 | 2 | 0.20 | 1.00 | 1.75 |
| Artificial Reef Created | 27 | 5 | 1.14 | 1 | 0.40 | 0.32 | 2.99 |
| Lake Photic Zone | 2.9 | 5 | 1.14 | 1 | 0.57 | 0.45 | 0.65 |
| Manatee Speed Zone | 80 | 0 | 1 | 2 | 0.03 | 1.00 | 1.20 |
| | | | | | | BALANCE | 3.28 |

* All impacts and mitigation converted to equivalent seagrass habitat.

HUs=[(acres)(lift)(seagrass conversion)] ÷ [(time factor)(risk factor)]